

Application Serial No. 10/627,105  
In reply to Office Action of 12 July 2007

Attorney Docket No 79865

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. (currently amended) An optical fiber cable comprising:

an inner layer of strength members wherein each strength member of said inner layer of strength members is a plurality of steel wires encased in a plastic tube;

an outer layer of strength members wherein each strength member of said outer layer of strength members is a plurality of steel wires encased in a plastic tube;  
[[and]]

at least one tube containing at least one optical fiber incorporated into said outer layer and adjacent to at least one strength member of said outer layer of strength members wherein a diameter of said at least one tube is smaller than a diameter of each strength member of said outer layer; and

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a polymer coating encasing each said at least one tube such  
that the diameter of said tube approximates the  
diameter of each strength member of said outer layer.

2. (original) An optical fiber cable according to claim 1,  
wherein said at least one tube is formed from stainless steel  
and has an internal gel and said optical fiber is surrounded by  
said gel and floats within said gel.

3. (canceled)

4. (canceled)

5. (original) An optical fiber cable according to claim 1,  
further comprising Bragg grating sensors spaced along a length  
of said optical fiber cable.

6. (canceled)

7. (original) An optical fiber cable according to claim 1,  
further comprising a first jacket surrounding said inner layer  
and a second jacket surrounding said outer layer.

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8. (original) An optical fiber cable according to claim 7, further comprising each of said first and second jackets being formed from a plastic material.

9. (currently amended) A system for determining a velocity profile of sound in a medium comprising:

an optical fiber cable suspended in the medium, the optical fiber cable having an inner layer of strength members wherein each strength member of said inner layer of strength members is a plurality of steel wires encased in a plastic tube, an outer layer of strength members wherein each strength member of said outer layer of strength members is a plurality of steel wires encased in a plastic tube, and at least one tube containing at least one optical fiber incorporated into the outer layer and adjacent to at least one strength member of said outer layer of strength members wherein a diameter of said at least one tube is smaller than a diameter of each strength member of said outer layer and a polymer coating encasing each said at least one tube such that the diameter of said tube approximates the diameter of each strength member of said outer layer;

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said at least one optical fiber having a plurality of Bragg  
grating sensors spaced along its length;

an optical pulse generator for sending an optical pulse  
into the optical cable;

an acoustic pulse generator for sending an acoustic pulse  
generally along the length of the optical fiber cable,  
the acoustic pulse causing local strain in the optical  
cable, the local strain causing the Bragg grating  
sensors in the vicinity of the strain to selectively  
reflect the optical pulse back in the direction of the  
optical pulse generator;

a timer for receiving the reflected optical pulse and  
measuring a time of arrival of the reflected optical  
pulse; and

a processor for computing the sound velocity profile as a  
function of the time of arrival.

10. (original) A system according to claim 9, wherein the  
acoustic pulse generator is a transducer array.

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11. (original) A system according to claim 9, wherein the transducer array is a steerable array for accurately directing the acoustic pulse along the length of the optical fiber.

12. (original) A system according to claim 9, wherein the optical pulse generator is a pulsed laser.

13. (original) A system according to claim 9, further comprising a platform for suspending the optical cable and for housing the acoustic pulse generator.

14. (original) A system according to claim 13, further comprising a weighted body attached at an end of the optical fiber cable opposite the platform, the weighted body assisting in extending the optical fiber cable from the platform.